



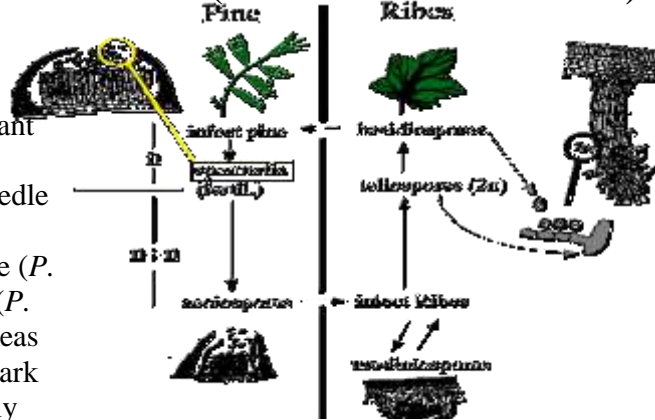
## Klamath Network Featured Creature

### October, 2009

### White Pine Blister Rust (*Cronartium rubicola*)

#### General Description:

White pine blister rust is a very ecologically and economically significant, non-native fungal plant pathogen with a dualistic life history. The fungus attacks 5-needle pines, such as sugar pine (*Pinus lambertiana*), western white pine (*P. monticola*), and whitebark pine (*P. albicaulis*). The fungus forms areas of dead tissue in the wood and bark (cankers) of these trees, gradually disfiguring them. It is common to see dead branches or tree tops as the pines come under attack, or dead trees, when they finally succumb. Death is often caused by secondary factors such as other fungi or attack by mountain pine beetles (*Dendroctonus ponderosae*). The cankers appear as patches of blistered and swollen looking tissue, usually several inches in size. Oozing from pustules is clear, often copious, sappy fluid. Yellow-orange spore bodies may be present in spring and early summer. A tree may have one to many cankers in varying stages of development.



Source: Forestpathology.org

#### Habitat and Distribution:

White pine blister came to North America on shipments of pines before 1915. It has spread to pines everywhere in the west from northern British Columbia to California and across the Rockies, mainly in mid-to high-elevation forests.

#### Interesting Facts:

Widespread efforts to control the disease by eradicating species of *Ribes* were unsuccessful and eventually abandoned. Selection and breeding of resistant pines is an active area of management to prevent the eventual extirpation of 5-needle pines from many areas where dramatic declines have occurred.

#### Where to see in the Network:

White pine blister rust is infecting many white bark pines at Crater Lake. To date, white bark pines in Lassen have been little affected. The Network will be monitoring the disease progression and impacts in subalpine forests of these parks.

#### More Information:

An Internet search will locate a plethora of information on this featured creature.

#### Life History:

The life cycle is remarkable in that the fungus requires an entirely different non-conifer host to complete its life cycle, whereupon it appears to be a completely different disease. As shown in the figure above, a complex process leads to sexual reproduction and production of diploid spores at canker margins on pines. These spores are dormant, desiccation-resistant, and may travel far. They cannot infect pines and will only germinate and grow on the leaves of a very few plants, almost exclusively species of gooseberries and currants (*Ribes* spp). On these shrubs, *Cronartium* forms two kinds of leaf infections, the secondary of which is a rusty growth that produces the spores that must disperse back to pines to complete the life cycle. Spores enter both types of hosts through stomata (leaf pores) on their leaves. There are five separate spore/germination phases in the lifecycle. Cool and moist conditions favor spore development and fruiting body growth.



Branch canker on whitebark pine at Crater Lake. Photo Sean Smith.



Monitoring blister rust on whitebark pines at Crater Lake. Photo: Sean Smith.